A120 - Detailed Design Specification Coversheet

System:	***Item Number:*** A120
Title: Detailed Designed Specification	
RFP Reference: Section VI Part 3, P.3	
Date of Submission: • Draft submission due 7 days prior to the Critical Design Review meeting. • Final submission due 10 days after the Critical Design Review meeting. • If approval of deliverable is contingent on incorporation of changes specified by CDCR, an updated submission incorporating the changes shall be provided within 10 days. • Updates: The design shall be updated to track all subsequent requirements related documents (e.g. test plans, approved change proposals, final test results) and changes to design to arrive at the final, agreed upon requirement set. The design shall be maintained current to within 10 days of any change to design specifications (unless otherwise specified and agreed) and to within 10 days of any requirements related documents.	
Distribution: • CDCR: 2 copies along with a magnetic media containing MS Office format copy. • V&V: 1 copy along with a magnetic media containing MS Office format copy.	
Approval: CDCR written approval is required.	
Comment: Change pages may be delivered upon approval of changes to the requirements until the cumulative total number of change pages reaches 10% of the final submission, upon which the entire document shall be re-issued.	

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Title: Detailed Designed Specification	
Preparation Instructions: The Contractor shall provide this document according to the standards defined in the documentation plan. The deliverable(s) shall include at a minimum the contents of the template in and/or following this coversheet, or equivalent as determined by the Project Director or designee. Providing less information than required in the template or any exceptions shall not be allowed unless advance written permission is obtained from the Project Director or designee.	

Detailed Design Specification Template

The following is a template for the Detailed Design Specification (DDS). This design document is a generalization of a software detail design document, based on content requirements specified for both a system design document and a software design document. The goal of the DDS is to identify all components of the system; hardware, software, database, and interfaces. The DDS is reviewed at the Critical Design Review and is used to guide the Development Process.

The DDS is published and approved after the Critical Design Review (CDR). The CDR DDS is complete when all components of the system have been sufficiently addressed so that the builders can directly implement the components defined in this document and produce the required system. That is, there are no unanswered questions about how a requirement is addressed, the functionality to be provided, or what external inputs and outputs exist, in the system.

The DDS uses the term "item" to refer to a component described in this document. Every item should be considered a configuration control item or an item within a configuration item.

1.0   SCOPE

Include a brief description of the purpose of the system to which the Detailed Design Specification applies and summarizes the content of the document. Define the boundaries, in general terms, of the Detailed Design Specification.

2.0   REFERENCES

List all documents referenced within this document.

2.1   Standards References

List all government, ISO, industry, enterprise/agency/division/department, project, and other directive documents applicable to the preparation of the design document and its contents.

2.2   Project References

List all project related documents that are referenced within this document.

3.0   DEFINITION, ABBREVIATIONS, AND ACRONYMS

List all terms and abbreviations, and the definitions used in this document or reference the document that contains the definition appropriate for this document. Include a table or list that shows the construction of each acronym, alphabetically, used in this document.

4.0   DETAILED ITEM IDENTIFICATION

Identify all items that will be used to describe and construct the system to be developed. Include narrative, charts and drawings used to identify and delineate the operation and interaction of all components in the system: including the users and any external systems that are needed.

Each of the sub-sections below; Software Detailed Design, Hardware Detailed Design, Database Conceptual and Logical Design, Software Interface Design, Hardware Interface Design, and Program Specifications may be a reference to a document(s) containing the actual design information. When dealing with large systems both project and configuration management may be improved by having multiple documents, rather than one large document.

When a system is to be described using a reference document, the corresponding sub-section in section 4 will contain the reference to the appropriate document(s). The corresponding sub-section in section 5 will be removed. Within a given sub-section in this document there will either be a reference to another document(s) or the actual detailed design information, but not both.

4.1   Overview

Provide a brief discussion of the approach being used for the detailed design. The overview should deal with the functionality of the system as well as the expected users and their interaction with the developed system. The reason for the development effort and the benefits expected from the selected design should also be discussed. Additionally, any system-wide design decisions should be discussed and referenced here. An example may include selected approach to meeting the safety, security, and privacy protection requirements regarding CDCR data. Also, any considerations of Bargaining Unit Contract Adherence may be addressed here.

4.2   Software Detailed Design

Include narrative, diagrams and charts describing all software items (components, modules, units, etc.) and their relationships within the system. Also, discuss the design decisions and concept of execution.

4.2.1 – Software Design

Describe all software items comprising the system to be developed. Using the deliverables from the analysis phase, the business functions should be assembled and design modules constructed. The medium for delivering the business functions should be determined and documented here. Some examples of software items are menu structures, screens, reports, screen dialogues, common or reusable processes, and batch procedures. Identify each item's development status, if known (such as new development, existing component to be reused as is, existing design to be used as is, existing component to be re-engineered). Each software item identified in this section will have an entry in the Software Items section below (Section 5.1).

4.2.2 – Software Design Decisions

Describe the design decisions, assumptions, and constraints made regarding the software; inputs, outputs, behavior, data (databases and files), safety, security, and construction. Also address performance, response, states, algorithms, privacy, physical criteria, availability, flexibility, and maintainability. Describe the class(es) of design method used, including but not limited to function-oriented, data oriented, real-time control oriented, object oriented, and language oriented. Describe the methodology used to decompose the software into items and components (including but not limited to top-down, bottom-up, object-oriented.)

4.2.3 – Concept of Execution

> Describe the execution among the various software items. The relationships such as dynamic, control flow, data flow, timing/sequencing, concurrency, tasks, processes, and storage between all the system components (identified items) must be described. This section should also cover assembly, deployment, and operation of the system.

4.3   Hardware Detailed Design

> Include narrative, diagrams and charts describing all hardware items (components, modules, units) and their relationships within the system. Also cover the design decisions and concept of execution.

4.3.1 – Hardware Design

> Describe all computer hardware resources (including but not limited to, processors, memory, input/output devices, auxiliary storage, and communications/networking equipment) necessary to develop the system. Each hardware item description should, as applicable, identify the users of the resource, and describe the characteristics of the resource. Present a diagram that identifies and shows the relationships among the planned specifications for the system hardware components, including network/communications maps. Each hardware item identified in this section will have an entry in the Hardware Items section below (Section 5.2).

4.3.2 – Hardware Design Decisions

> Describe the design decisions, assumptions and constraints made regarding the hardware, including inputs, outputs, behavior, data (database/files), safety, security, and construction. Also address priority, performance, response, states, algorithms, privacy, physical criteria, availability, flexibility, and maintainability. Describe the class(es) of design method used, including but not limited to function-oriented, data oriented, real-time control oriented, object oriented, and language oriented (as applicable).

4.3.3 – Concept of Execution

> Describe the execution among the various hardware items. The relationships such as dynamic, control flow, data flow, timing/sequencing, concurrency, tasks, processes, and storage between all the system components (identified items) must be described. Also cover assembly, deployment, and operation of the system.

4.4   Database Design

> Include narrative, diagrams and charts describing the logical and physical design of all database items and their relationships within the system design. Also cover the design decisions.

4.4.1 – Database Design

> Describe all data elements, translating all entities into tables or files. The required views, keys, and indexes should also be identified. The designed files and tables should be tuned for performance and capacity needs. Implications for data conversion should be discussed here. The software design must be coordinated with the database design to ensure the right trade-off decisions are made with regard to tuning. A detailed sizing and capacity plan should also be discussed here. This section should address the database audit, control, security, volume and performance

requirements. Each database item identified in this section will have an entry in the Database Items section below (Section 5.3).

4.4.2 – Database Design Decisions

Describe the design decisions, constraints and assumptions made regarding the database including inputs, outputs, behavior, data (database/files), safety, security, and construction. Also address performance, transaction volumes, response, states, algorithms, privacy, confidentiality, volatility, physical criteria, retention cycles, availability, flexibility, and maintainability. List any deviations from design standards, documenting the rationale for any changes. Describe the class(es) of design method used, including but not limited to function-oriented, data oriented, real-time control oriented, object oriented, and language oriented, and the impact on the database design.

4.5   Software Interface Design

Include narrative, diagrams and charts describing all software interfaces and their relationships within the system design.

4.5.1 – Software Interface

Describe all software interfaces necessary to develop the system. The standards and conventions governing these interfaces should be described here. The Software Detailed Design (Section 4.2) should be utilized in the development of this section. Identify each item's development status, if known (such as new development, existing component to be reused as is, existing design to be used as is, existing component to be re-engineered). Each interface item should identify whether it is fixed, thereby imposing interface requirements on other entities, or modified, thus having interface requirements imposed. Also specify if the interface is external (impacting other systems) or internal to this system. Each software interface item identified in this section will have an entry in the Software Interface Items section below (Section 5.4).

4.5.2 – Software Interface Decisions

Describe the design decisions, assumptions and constraints made regarding the software interfaces, including inputs, outputs, behavior, data (database/files), safety, security, and construction. Also address priority, performance, response, states, algorithms, privacy, physical criteria, availability, flexibility, and maintainability. Describe the class(es) of design method used, including but not limited to function-oriented, data oriented, real-time control oriented, object oriented, and language oriented, and the impact on software interfaces.

4.5.3 – Concept of Execution

Describe the execution among the various software interface design components. The relationships such as dynamic, control, data flow, timing/sequencing, concurrency, tasks, processes, and storage between all the system components (identified items) must be described. Also cover assembly, deployment, and operation of the system.

4.6   Hardware Interface Design

Include narrative, diagrams and charts describing all hardware interfaces and their relationships within the system design.

4.6.1 – Hardware Interface

Describe all hardware interfaces necessary to develop the system. The standards and conventions governing these interfaces should be described here. The Hardware Detailed Design (Section 4.3) should be utilized in the development of this section. Each interface item should identify whether it is fixed, thereby imposing interface requirements on other entities, or modified, thus having interface requirements imposed. Aalso specify if the interface is external (impacting other systems) or internal to this system. Each hardware interface item identified on the diagrams and charts in this section will have an entry in the Hardware Interface Items section below (Section 5.6).

4.6.2 – Hardware Interface Decisions

Describe the design decisions made regarding the hardware interfaces, including inputs, outputs, behavior, data (database/files), safety, security, and construction. Also address priority, performance, response, states, algorithms, privacy, physical criteria, availability, flexibility, and maintainability. Describe the class(es) of design method used, including but not limited to function-oriented, data oriented, real-time control oriented, object oriented, and language oriented, as applicable.

4.6.3 – Concept of Execution

Describe the execution among the various hardware interface design components. The relationships such as dynamic, control flow, data flow, timing/sequencing, concurrency, tasks, processes, and storage between all the system components (identified items) must be described. Also cover assembly, deployment, and operation of the system.

4.7   Data Dictionary

Provide complete description of all names used or referenced in any section in this document. The information captured should include; data type, size and format, units, range of values, editing rules, accuracy, error tolerance, precision, priority, timing, frequency, privacy and security, volume, sequencing, sources and recipients, data change requirements, valid data and record requirements, and any constraints imposed or assumed. If the system is large enough to warrant reference documents in the above section, this section should become a reference to the master data dictionary.

4.8   Program Specifications

Provide description of items and the steps associated with each item needed to construct the software programs comprising the system. The detailed program specifications should be constructed from the outputs of software design, hardware design, software interface design, hardware interface design, and database design. The specifications should be produced in a narrative form, and should allow the developers to build or customize software programs to support the system. Each program specification item identified in this section will have an entry in the Program Specification Item section below (Section 5.6).

4.9   Notes

Include any general information that increases the understanding of the document.

5.0   DETAILED ITEM DESCRIPTIONS

Provides a complete description of all hardware, software, database, interface, and program items identified in the item identification section above. All system requirements should trace to some item/operation in this section before the system design is considered complete.

5.1   Software Items

Describe all identified software items from the Software Design section (Section 4.2.1) above.

5.1.1-x – Software Item (name specified in charts or diagrams above)

Each software item will be discussed in a subsection of its own.

5.1.1-x.1 Software Item Description

The item discussion will cover; name, type, characteristics, purpose, function, subordinates, dependencies, interfaces, security issues (personnel, data), resources, processing, interrelationships among the components, and data.

5.1.1-x.2 Software Design Traceability

The design item for which this item is providing functionality. If this item traces back to multiple design items, all items should be listed here.

5.2   Hardware Items

Detailed descriptions of all identified hardware items from the Hardware Design section (Section 4.3.1) above.

5.2.1-x – Hardware Item (name specified in charts or diagrams above)

Each hardware item will be discussed in a subsection of its own.

5.2.1-x.1 Hardware Item Description

The item discussion will cover; name, type, purpose, function, subordinates, dependencies, interfaces, security issues (personnel, data), resources, processing, and data. Each description shall, as applicable, identify the hardware and software items that will use the resource, describe the allocation of resource utilization to each software item that will use the resource, describe the conditions under which utilization will be measured, and describe the characteristics of the resource.

Descriptions of computing resources shall include, as applicable, manufacturer name and model number, speed and capacity, identification of architecture, character set standards, memory size, type, speed and configuration, data transfer rates/capacities, network topology, protocols used, diagnostic capabilities, and growth capabilities.

5.2.1-x.2 Hardware Design Traceability

The design item for which this item is providing functionality. If this item traces back to multiple design items, all items should be listed here.

5.3   Database Items

Detailed descriptions of all identified database items from the Database Design section (Section 4.4.1) above.

5.3.1-x – Database Item (name specified in charts or diagrams above)

Each database item will be discussed in a subsection of its own.

5.3.1-x.1 Database Item Description

The database item discussion will cover; name, type, characteristics, purpose, function, subordinates, dependencies, interfaces, security issues (personnel, data), resources, and processing volumes. The discussion should also cover behavioral design, considerations for safety, security, and privacy protection.

5.3-x.2 Database Design Traceability

The design item for which this item is providing functionality. If this item traces back to multiple design items, all items should be listed here.

5.4   Software Interface

Detailed descriptions of all identified software interface items, including user interfaces, from the Software Interface Design section (Section 4.5.1) above.

5.4.1-x – Software Interface Item

Each software interface item will be discussed in a subsection of its own.

5.4.1-x.1 Software Interface Item Description

The software interface item discussion will cover; name, type, characteristics, purpose, function, subordinates, dependencies, interfaces, security issues (personnel, data), resources, processing, and data. Sources and recipients should also be covered.

5.4.1-x.2 Software Interface Design Traceability

The design item for which this software interface is providing functionality. If this item traces back to multiple design items, all items should be listed here.

5.5   Hardware Interface

Detailed descriptions of all identified hardware interface items, including user interfaces, from the Hardware Interface Design section (Section 4.6.1) above.

5.5.1-x – Hardware Interface Item

Each hardware interface item will be discussed in a subsection of its own.

5.5.1-x.1 Hardware Interface Item Description

The hardware interface item discussion will cover; name, type, characteristics, purpose, function, subordinates, dependencies, interfaces, security issues (personnel, data), resources, processing, and data. Communication methods, protocols, and physical compatibility should also be discussed in this section.

5.5.1-x.2 Hardware Interface Design Traceability

The design item for which this hardware interface is providing functionality. If this item traces back to multiple design items, all items should be listed here.

5.6   Program Specification Items

Describe all identified program specifications from the program specification section (Section 4.8) above.

5.6.1-x – Program Specification Item

Each Program Specification Item will be discussed in a subsection of its own.

5.6.1-x.1 Program Specification Description

The item discussion will cover; name, type, characteristics, purpose, function, subordinates, dependencies, interfaces, security issues (personnel, data), resources, processing, and data. The specification should identify and describe those modules which are required to read/write data, validate/edit input data, format output data, handle errors and exception conditions, initialize and terminate routines, and coordinate the functions of the lower level modules. The specifications should follow the structured methodology identified in subsection 4.2.2 above to decompose software into items and components. The programming language to be used and rationale for its use should also be included in the discussion.

5.6.1-x.2 Program Specification Design Traceability

The section should identify the design item for which this program specification is providing functionality. If this item traces back to multiple design items, all items should be listed here.

APPENDICES A-X?

Appendices are labeled alphabetically. Appendices may be used to contain referenced information or information which might otherwise have rendered the document less readable if placed in the main body. Appendices may also be used for information that needs to be bound separately for security reasons. The contractor should use as many appendices as is reasonable and makes sense for the deliverable.